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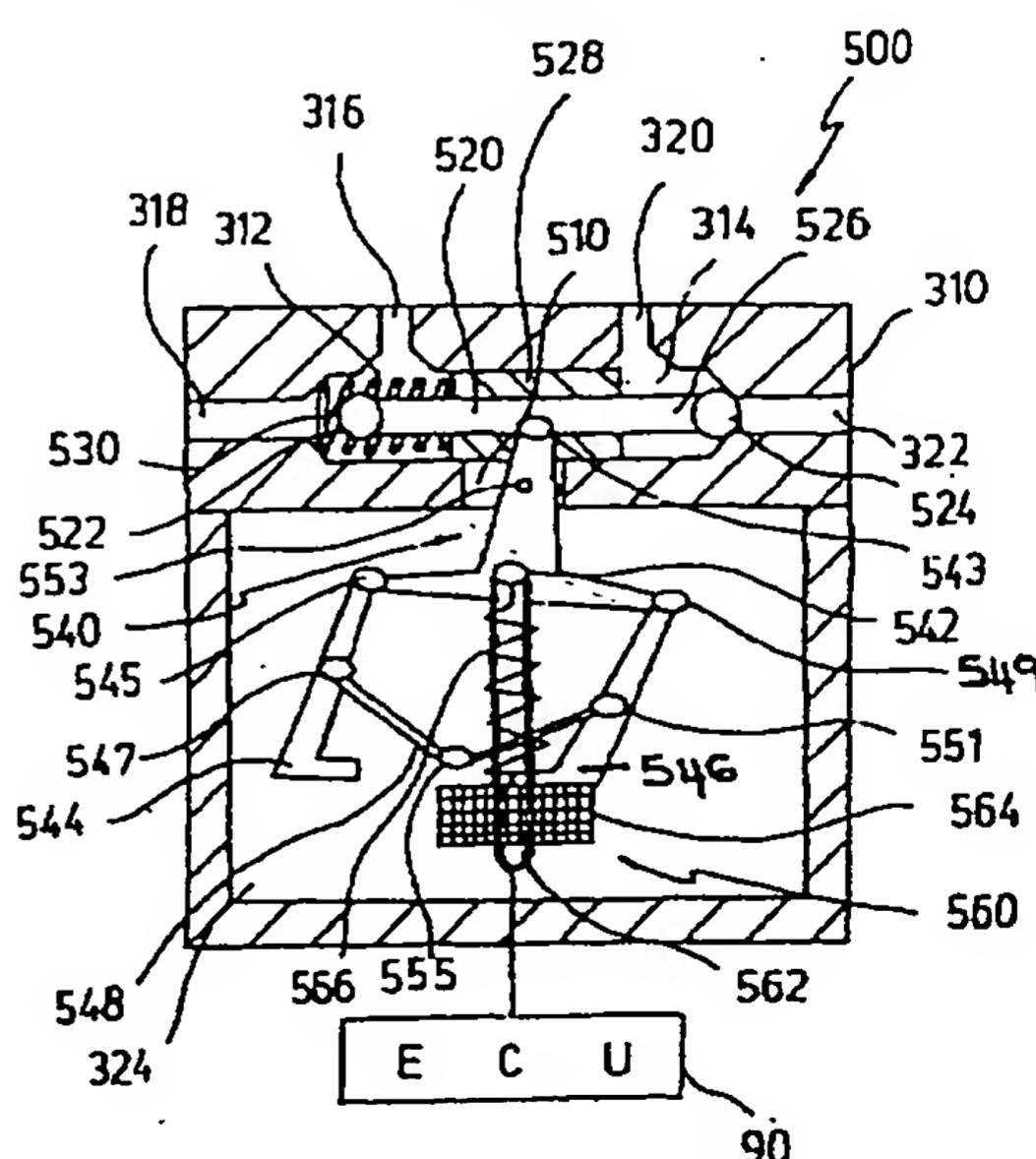
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(54) Valve utilising shape memory alloys and an anti-lock brake system incorporating the valve

(57) A valve (500) has a pressure port (316) and an exhaust port (320) controlled by a reciprocable valve spool (520). A bias spring (530) maintains the valve spool (520) in its first position in which pressure port (316) is open and exhaust port (322) is closed. Where the valve (500) is used in an anti-lock braking system, in this first position brake fluid is flowed via an inlet (318) and bore (312) out of the pressure port (316) to pressurise a brake. An actuating unit (560) for moving the valve spool (520) comprises a series of pivoted links (542, 544, 546, 548) and an actuating shape memory alloy wire (562) connected to the first link (542) and to an actuating block (563) suspended from the third link (546). Application of electrical current to the wire (562) contracts it causing pivoting of the links and movement of the valve spool (520) to a second position in which the pressure port (316) is closed and the exhaust port (322) is open. The supply of pressuring fluid to the brake is thereby ceased, and fluid can be flowed from the brake via an inlet (320) and a bore (314) to the exhaust port (322) to release pressure from the brake. Removal of the electrical current from the wire (562) relaxes it and the bias spring (530) is able to restore the valve spool (520) to its first position.

FIG.7



EP 0 697 315 A3



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## EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
P,A	EP 0 614 033 A (PERLMAN MAIER ; BELL JAMES MICHAEL (CA); MARTIN RICHARD L (US); MCG) * column 2, line 11 - column 3, line 24; figures 1-3 *	1	B60T8/36 F16K31/02
A	EP 0 144 790 A (MATSUSHITA ELECTRIC IND CO LTD) * page 8, line 16 - page 12, line 8; figures 5,6 *	1	
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)			
B60T F16K			
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<p>Place of search</p> <p>BERLIN</p>		<p>Date of completion of the search</p> <p>25 September 1997</p>	Examiner
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p>		<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>	